Olfactory Hallucinations as the Initial Presentation of a Cavernous Sinus Meningioma

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BACKGROUND

Cavernous sinus meningiomas (CSM) are complex cranial base tumours that are a veritable challenge for skull base surgeons. Initially seen as unresectable masses, there has been significant progress in the therapeutic management of these neoplastic entities. Despite recent advancements, there are still many aspects of pathogenesis and symptomatology that require further investigation.

CASE PRESENTATION

We present the case of a 57-year old, neurologically intact female patient who experienced a 18 months history of olfactory hallucinations, reporting a persistent feeling of tobacco smell. Two weeks before she presented to the otolaryngology outpatient clinic she started experiencing visual problems which prompted her GP to expedite the consult.

On examination, she displayed a unilateral temporal visual field defect, but otherwise normal cranial nerve assessment, no papilledema, no motor or sensory deficit and no sinonasal pathology on fibreoptic nasendoscopy. Her mental status was intact, thus the psychiatric nature of the phantosmia was ruled out. She had no relevant past medical history, no history of trauma, no loss of consciousness or seizures, no allergies and never smoked.

MRI was performed and revealed a meningioma centred in the left cavernous sinus, extending along the middle cranial fossa into Meckel's cave to distort the left temporal lobe, affecting the left optic nerve with optic canal involvement (Fig. 1). The patient underwent a Simpson II resection (Fig. 2) and her recovery was uneventful. At follow up she reported the resolution of phantosmia and objective improvement in her visual field defect.

In literature, this appears to be the first reported case of a cavernous sinus meningioma initially presenting as olfactory hallucinations.

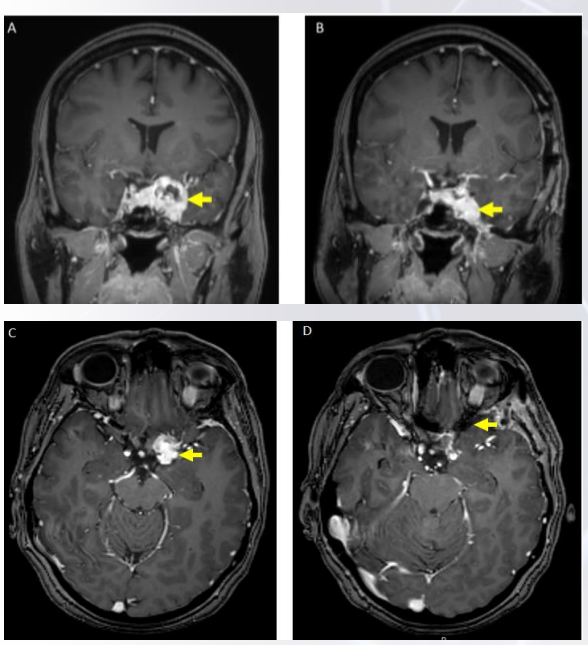

Fig 1. Preoperative imaging (**A, C**) and postoperative imaging (**B**, **D**). Extracavernous component / anterior clinoidal meningioma reduced in size after Simpson II resection with decompression of optic nerve and olfactory tract

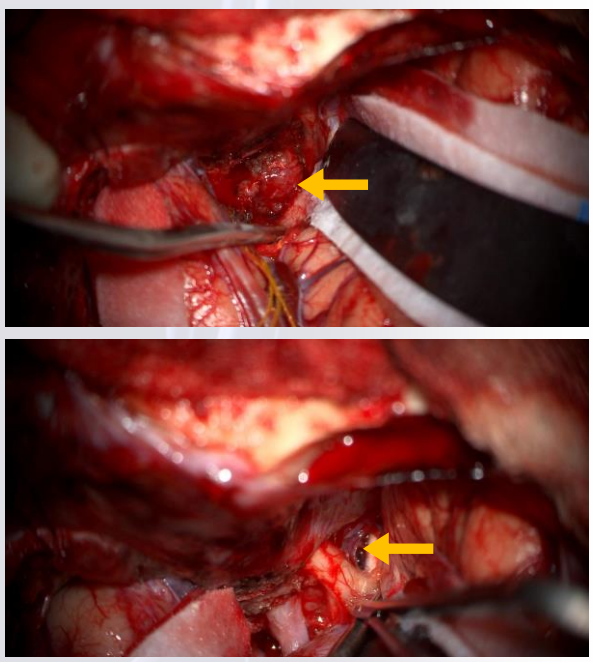

Fig. 2. **G**. Tumour in situ **H**. Optic nerve decompression

DISCUSSIONS

Neurological disorders such as Parkinson's disease, migraines and temporal lobe epilepsy have been documented to display olfactory hallucinations. However, phantosmia secondary to cerebral neoplasms has rarely been described in literature.

Olfactory groove meningiomas have been cited as responsible for this symptom [1]. Olfactory hallucinations were the first symptom of multifocal anaplastic astrocytomas in a patient who felt the smell of baked potato in the absence of any objective odour [2]. Other examples of these type of hallucinations include a patient with brain metastases [3], one with a microcystic adenoma of the ethmoid sinus in the context of Hippel-Lindau disease [4] and one with a large disseminated glioblastoma who felt the smell of burning tires [5]. Phantosmia can also be iatrogenic after transcribriform approach [6] or radiotherapy[7]. In our case of CSM compression, an explanation for the phantosmia could be provided by the anatomy of the olfactory tract, which originates from the inferior frontal and inferomedial temporal lobe and of the olfactory bulb, which is part of the limbic pathway.

CONCLUSION

- Meningiomas in the cavernous sinus have an unpredictable outcome, especially due to their particular anatomical involvement.
- Olfactory hallucinations have never been described so far as a consequence of a cavernous sinus mass.
- When dealing with such an issue (in the absence of sinonasal pathology), cerebral neoplasms should always be considered in the differential diagnosis.

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